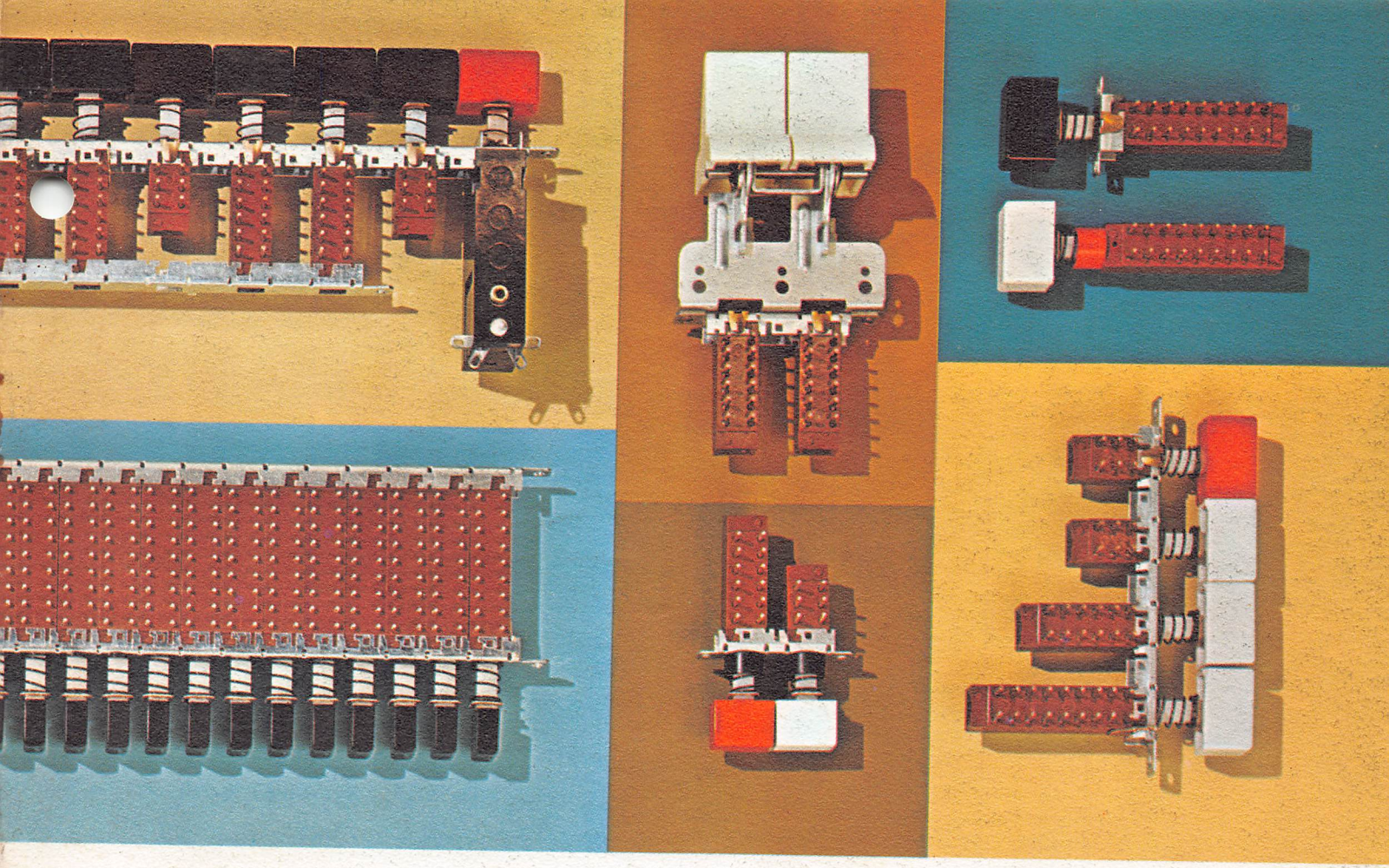

PUSH BUTTON SWITCHES

CENTRALAB
Electronics Division
GLOBE-UNION INC.

GENERAL INFORMATION

Centralab, recognizing the need for a low cost, versatile push button switch capable of printed circuit board mounting, offers this series of switches to meet these needs. These switches are designed around a basic module which can be mounted or coupled to other modules within three standardized sets of dimensions. Individual modules are available in two, four, six, or eight pole double throw designs.

The modular design and automated manufacturing techniques result in a product which offers an almost infinite number of combinations available to solve your switching problem.

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Series PB-20PK 18

Nomenclature . . . . . Fold Out

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INTRODUCTION

These new Centralab Push Button Switches are being manufactured for sale in the United States, Canada, Mexico and Central America under exclusive license from L'Isostat, Paris, France under United States patent numbers 3,229,548; 3,259,699 and 3,259,728.

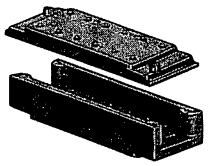
The production machinery used in the manufacture of these switches has been in use for over five years. During this time millions of units have been produced and used in electronic products in England, Continental Europe, and more recently, the United States. The production machinery being used by Centralab represents the current models of these thoroughly proven tools.

The products which result from this mechanized process have excellent dimensional repeatability and accuracy. This is of prime importance when used with printed circuit boards or any other system of automated assembly.

Centralab is now producing this switch in an all new facility located adjacent to our Research and Administrative Park. Should the need arise, the worldwide facilities of L'Isostat are available to augment our own production capabilities.

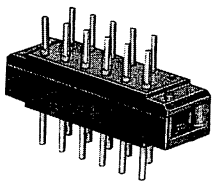
BASIC MODULE ELEMENTS

Stator block A two piece precision molded phenolic block with holes provided for insertion of the fixed contacts. This assembly provides a housing which encloses and protects the slider bar and moving contacts.



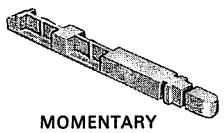
STATOR BLOCK

Fixed contacts Double silver plated copper wires are automatically inserted into pre-molded holes in the stator block and then staked at both top and bottom to form the fixed contacts. Standard terminal length is .236" on both top and bottom contacts. The bottom terminal only is also available in a machine cut maximum length of .394" which may be reduced to an .078" minimum in increments of .078". The top terminal can be machine cut to .078" or .156" length as a secondary operation.

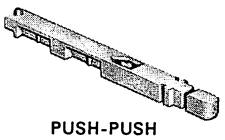


FIXED CONTACTS

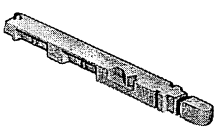
Slider bar A one piece injection molded Delrin® bar contains pockets to carry and position the moving contacts. It also incorporates the forward stop pin, button mounting grooves, interlock notches and push-push function cam as molded portions of the bar itself.



MOMENTARY

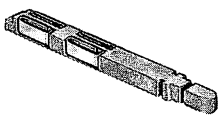


PUSH-PUSH



INTERLOCKING

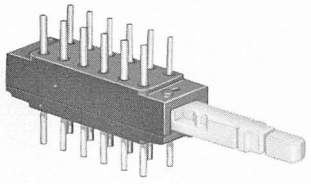
Moving contacts A roll silver plated special alloy is automatically formed and inserted into the slider bar to become the moving contact. These contact materials provide low contact resistance and long life. To provide smooth operation, the contacts float freely within the pockets in the slider bar and are located diametrically opposed to each other. This design centers the slider bar within the stator block and equalizes contact pressures between the moving contacts in the slider bar and the fixed contacts in the stator block.



MOVING CONTACTS

BASIC MODULES

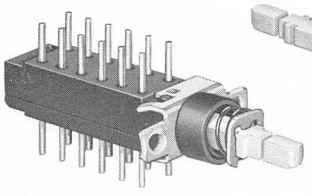
The assembly of the four basic elements creates an individual switch module. These individual modules are the building blocks of the Centralab push button switching system. All modules are identical in all overall dimensions except length, which is dependent upon the number of poles required by the individual module.



BASIC MODULE

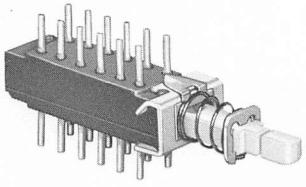
FUNCTIONS

Momentary operation In this type of operation the slider bar only remains in as long as it is pressed, and it returns to its original position as soon as pressure is released. The switching function is maintained by pressure on the button.



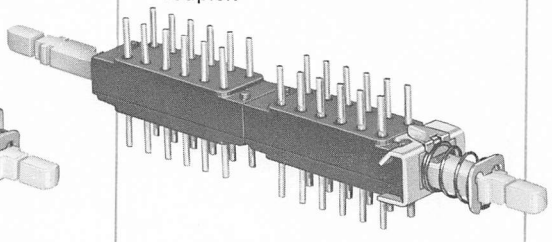
MOMENTARY

Push-push operation In this type of operation the slide bar remains in when pressed and must be pressed again to return to its original position. The switching function continues as long as the button is engaged. This operation is controlled by the push-push pin and pin spring mechanisms.



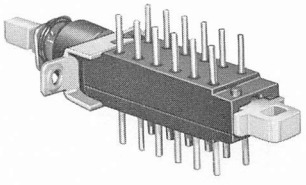
PUSH-PUSH

Coupling modules back to back When desired, two modules may be connected to permit a maximum of fourteen poles to be operated by a single button. This is accomplished by connecting the slider bars with a coupler.



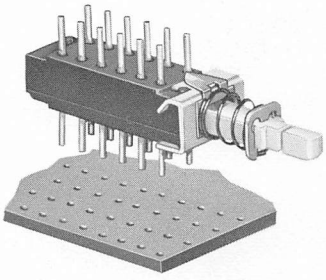
BACK-TO-BACK COUPLING

Rear coupling When desired, a coupling can be provided that will permit the switch to perform additional functions. This consists of an adapter ring which is attached to the rear end of the slider bar and may be used to provide an alternate source of activation.

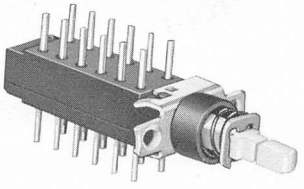


REAR COUPLING

Mounting An individual switch module may be mounted by plugging it into a printed circuit board, in which case it is supported by the fixed contact pins, or by securing it to the standard mounting bracket having a .110" mounting hole or using a #4 self-tapping sheet metal screw.



PC BOARD



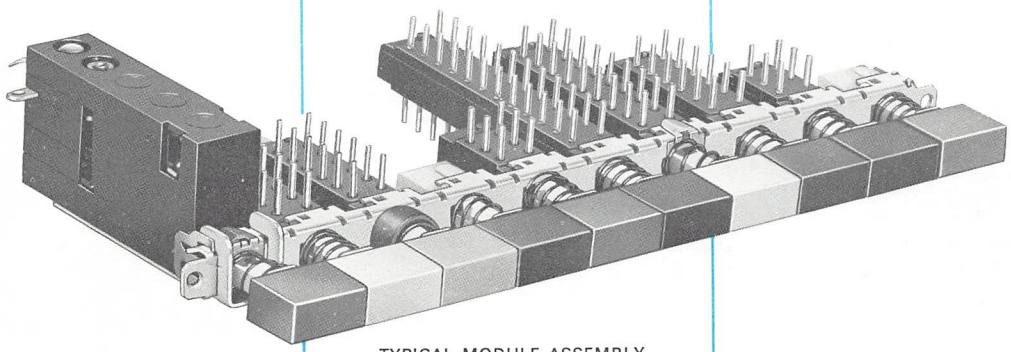
STANDARD BRACKET

MODULE ASSEMBLIES

When desired, individual modules may be ganged together on a common mounting bracket. There are three basic center-to-center mounting distances available between modules. These are:

Series PB-10 — .394″
Series PB-15 — .591″
Series PB-20 — .787″

Modules, when ganged, retain all of the features of the individual modules and also provide the following advantages.



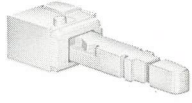
TYPICAL MODULE ASSEMBLY

LATCHING COMBINATIONS

Interlocking This enables the connection of a group of modules so that when any button of the latch bar group is pressed, it automatically disengages any other button of the group that was engaged. This requires a slider bar with locking ramps, and a latching bar and spring.

Intermixing The Centralab push button switch is so versatile that almost any combination of switching functions may be employed on a single mounting bracket. Generally speaking, all functions (push-push, momentary and interlocking) can be utilized in any position on the bracket. For details and limitations, see the data on individual series of switches.

Clearing module As an option, a clearing module can be provided for releasing an engaged switch when interlocking switching is used. This module has no contacts but it provides a mechanical means of activating the interlocking mechanism. It is available with either momentary or interlocking action.



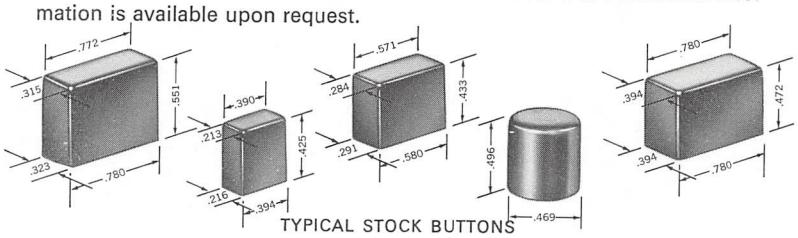
CLEARING MODULE

Mounting brackets Brackets are of cadmium plated steel with a choice of .110″ drilled mounting holes or extruded holes for #4 self-tapping sheet metal screws. See each individual series for details and dimensions.

Module spacing See series drawings for details.

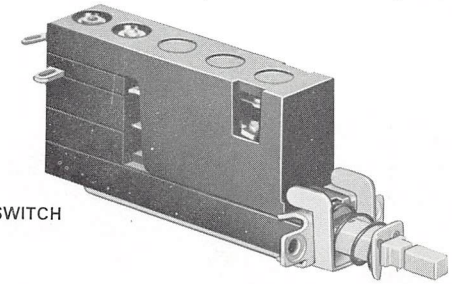
OPTIONAL ACCESSORIES

Buttons Typical button styles and sizes are illustrated. These are available in black, white, red, grey, cream, and special colors and finishes. Buttons may be ordered in bulk or cemented onto the slider bar. Additional information is available upon request.

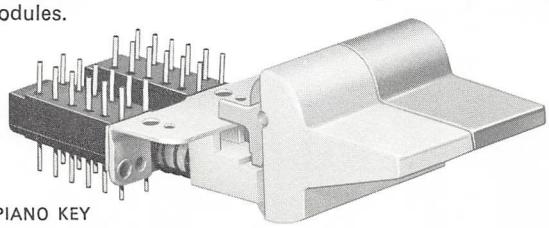


TYPICAL STOCK BUTTONS

Line Switches Single or double pole line switches are available. These switches may be assembled to any standard mounting bracket.


LINE SWITCH

Piano key action This action is available only for the Series PB-20 spacing. These keys are attached to the mounting bracket and coupled to switch modules.


PIANO KEY

MECHANICAL

Stator block Compression molded of a thermosetting general purpose phenolic per MIL-C-13428A and the requirements of ASTM Specification No. D700-57T, Type 2.

Slider bar Injection molded thermo-plastic acetal resin Delrin.®

Contacts Stator Block (fixed) Copper wire, silver plated to facilitate soldering and provide a low resistance coating on the contact surfaces. Slider Bar (moving) Copper alloy with a roll silver overlay to provide a smooth, dense surface for long lasting, low friction operation.

Hardware Brackets and latch bars are steel, plated for commercial use. The interlatch and push-push springs are copper alloy.

Push pressure The push-pull force required to actuate an individual module (without return spring) varies directly with the number of poles per module. Approximate values for the force required are as follows:

2 pole — 4 oz.
4 pole — 6 oz.
6 pole — 8 oz.
8 pole — 10 oz.

A return spring is used to overcome the "feel" caused by the release of the latching mechanisms and also to insure a smooth positive return. The force required to compress this spring is usually maintained at 2 to 3 pounds. Slightly higher or lower values are obtainable by varying the return spring.

Lubrication Each individual module is lubricated during assembly and further lubrication is not required.

Life testing These are not snap-action switches; therefore life at any particular load is dependent upon the speed of switching. Our tests to develop ratings were set up as follows: Switches were mounted so that the slider bars were activated by cam driven plungers. There were 6 cams mounted on a common shaft which was rotating at 10 RPM. Each cam moved the plunger in and out in 60° of shaft rotation. Latching type switches were used; therefore the making of the circuits was a factor of the rotational-linear actuator speed, and the breaking of the circuits was a factor of the return spring loading which resulted in very rapid breaking. Faster or slower activation results in correspondingly shorter or longer arc duration and therefore greater or lesser life.

ELECTRICAL

Contact Resistance Terminal to terminal contact resistance has an average initial value of approximately 4 milliohms. When life tested with rated loads the final contact resistance is approximately 10 milliohms.

Current and voltage ratings Current and voltage ratings for 25,000 cycles with a 10 milliohm final contact resistance are as follows:

.45 amp at 115 VAC
1.00 amp at 28 VDC

Dielectric strength Ratings are for terminals in factory new condition. (When coated with solder some values may be lower.) Values are in VAC R.M.S. at room ambient temperature.

Frame to pins — 1000 VAC
Pin to pin (same pole) — 1500 VAC
Pin to pin (opposite pole) — 1500 VAC
Pin to pin (adjacent pole) — 1500 VAC

Insulation resistance Values given are for modules in factory new condition. Initial ratings are at 70% RH at 70°F and are also given for the same units after 96 hours at 95-100% RH. All values given are average values.

Between pin and bracket — initial 6000 megohms; after humidity 100 megohms
Between adjacent pins — (pole to pole)
initial 65,000 megohms; after humidity 185 megohms
Between opposite pins — initial 50,000 megohms; after humidity 210 megohms

ENVIRONMENTAL

Temperature The use of Delrin® allows switches to withstand temperatures up to 180°F in continuous operation. The slider bar will tolerate a maximum of 550°F for a maximum of 9 seconds. This is well within the standard dwell time for soldering terminals by either conventional hand methods or wave soldering techniques.

CENTRALAB Electronics Division • 3E-
5757 NORTH GREEN BAY AVENUE • MILWAUKEE,

CUSTOMER

SERIES		MOUNTING BR
PB1		2-.110 Dia. Holes
PB10		2-#4 Metal Screw Hol
PB15		No Mounting Tabs
PB20		
PB20 Piano Key		Piano Key 2-.126 Dia.

	1	2	3
REAR BRACKET			
LATCH SPRING POS.			
LATCH CODE			
LINE SWITCH			
NO. OF POLES			
BUTTON NO.			
BUTTON COLOR			

SUPPLY BUTTONS — CEMENTED TO SLIDE

SPECIAL REQUIREMENTS AND NOTES

HOW TO ORDER

Select the proper series, mounting bracket, and terminal length.

The vertical columns represent individual modules as the switch is viewed from the button end and right side up. The modules and columns are numbered from left to right.

Number of Poles: Enter actual number of poles.

Latch Code: Enter code from chart.

Line Switch: Enter code from chart.

Rear Bracket: Enter an X if the Module is connected to the rear bracket.

Latch Spring: Enter a line thru the columns which represent interlocking modules and an X at one end of the line to indicate the location of the latch bar spring.

Button Number: Enter button part number in the proper column.

Button Color: Enter button color in the proper column.

INIL .C.
WISCONSIN 53201

PUSH BUTTON SWITCH SPECIFICATION SHEET

	CUSTOMER PART NO.	REV. NO.		DRAWN BY	DATE	CENTRALAB PART NO.

ACKET		TERMINAL LENGTH		POLE CODE	LATCH CODE	LINE SWITCH CODE
		.236 Top .236 Bottom (STD)		0 = Clearing Mod.		
S		.236 Top .079 Bottom (SPCL)		2 = 2 Pole	IL = Interlock	LS1 = 2PSTNO
		.236 Top .157 Bottom (SPCL)		4 = 4 Pole		
		.236 Top .315 Bottom (SPCL)		6 = 6 Pole	PP = Push-Push	LS2 = 2PDT
Holes		.236 Top .394 Bottom (SPCL)		8 = 8 Pole	M = Momentary	LS3 = 2PSTNC

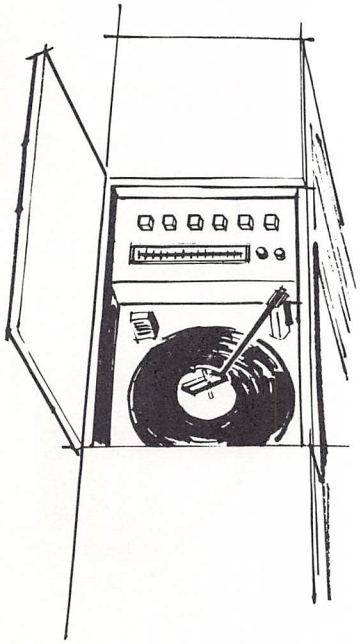
4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

BAR		SUPPLY BUTTONS — BULK WITH SHIPMENT	

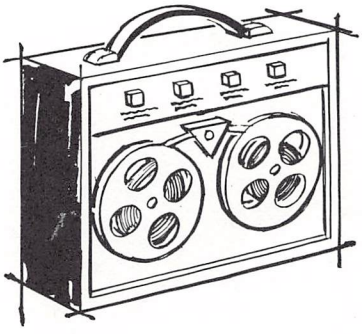
CHANGES

APPLICATIONS

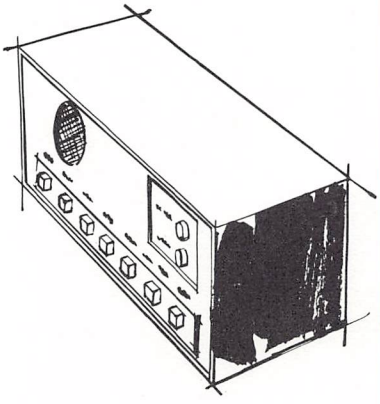
CONSUMER



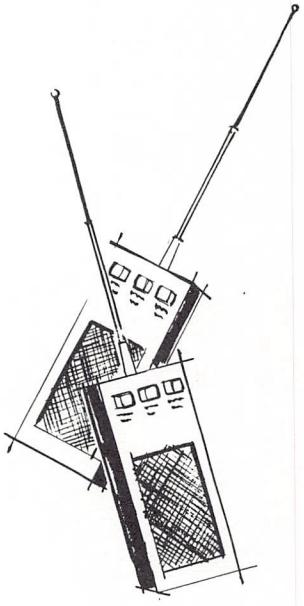
Stereo



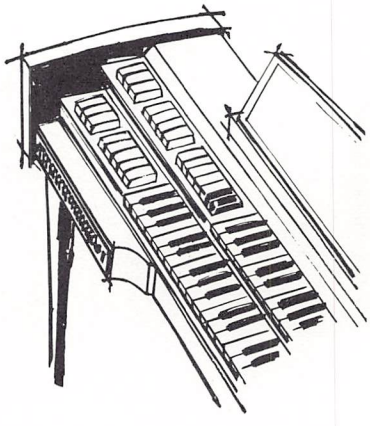
Tape Recorder



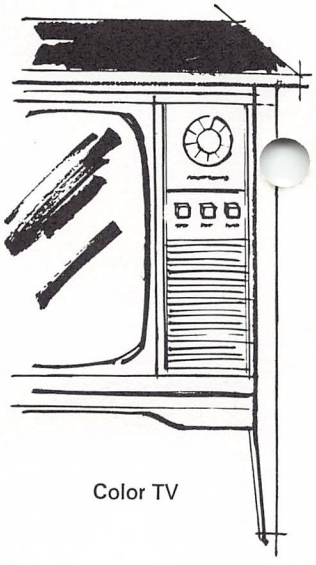
Intercoms



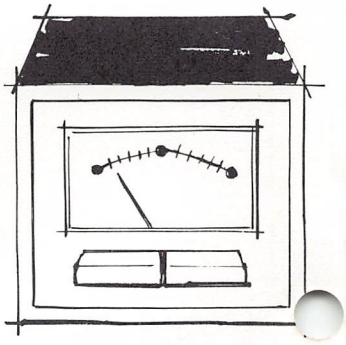
Transceivers



Electronic Musical Instruments

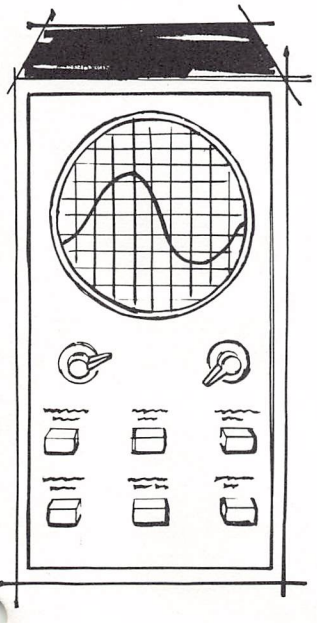


Color TV

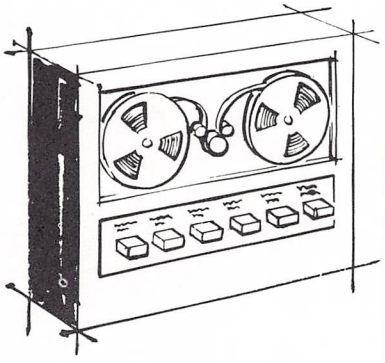


Antenna Rotors

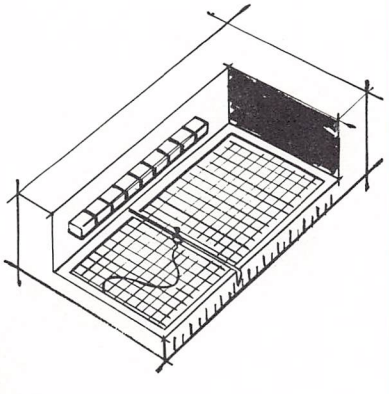
INDUSTRIAL-MILITARY



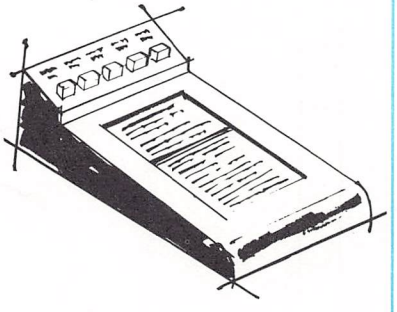
Oscilloscopes



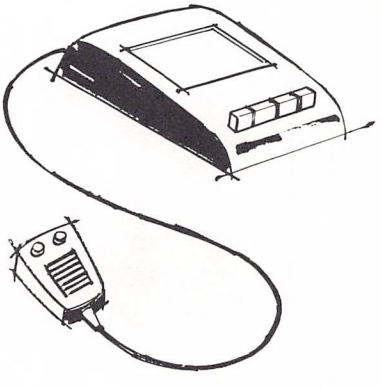
Computer Peripheral Equipment



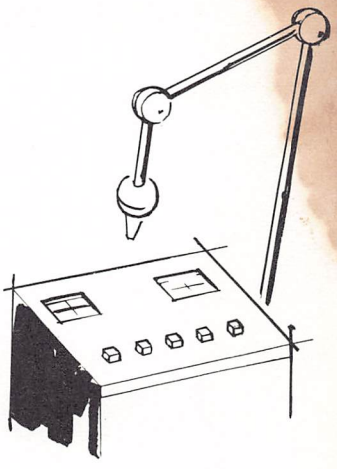
X-Y Plotters



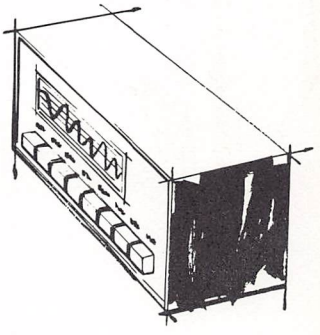
Teaching Machines



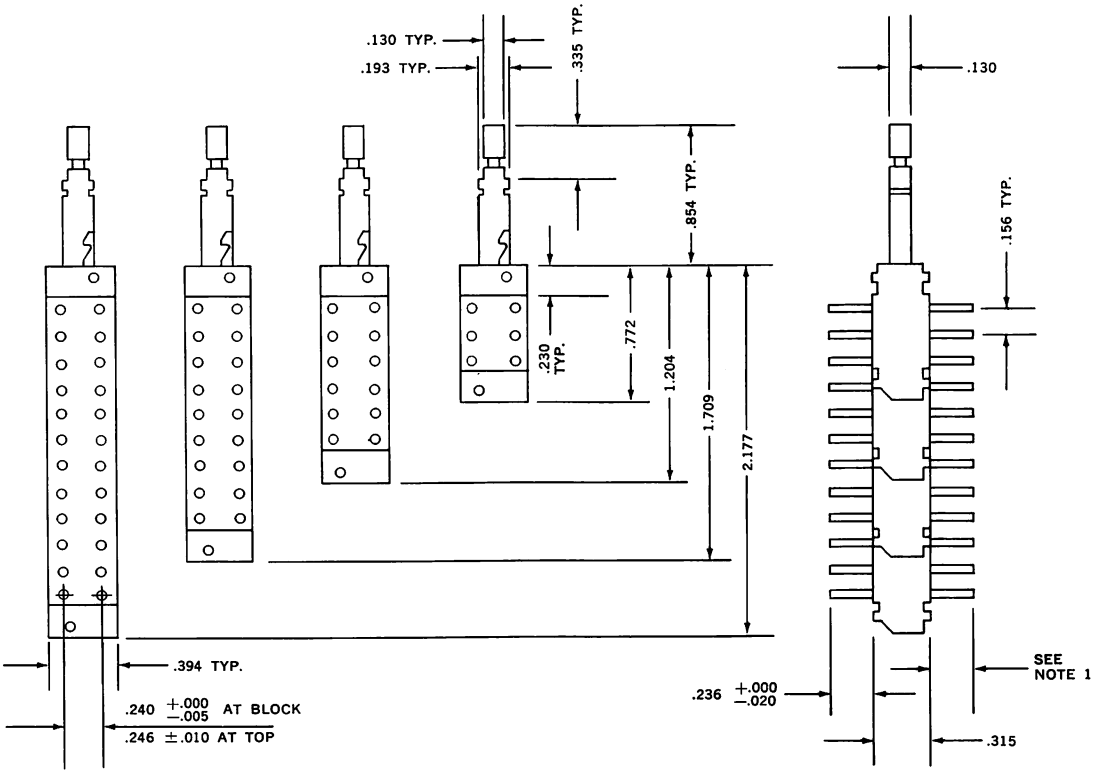
Business Machines



X-Ray Equipment

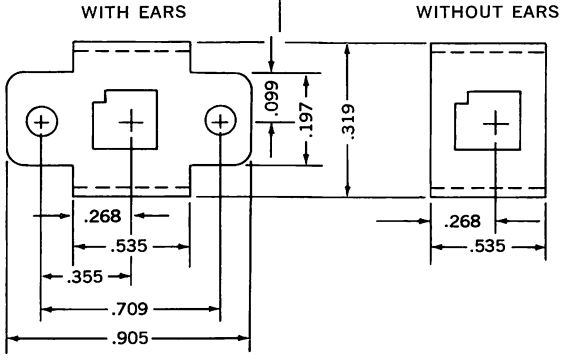


Transceivers

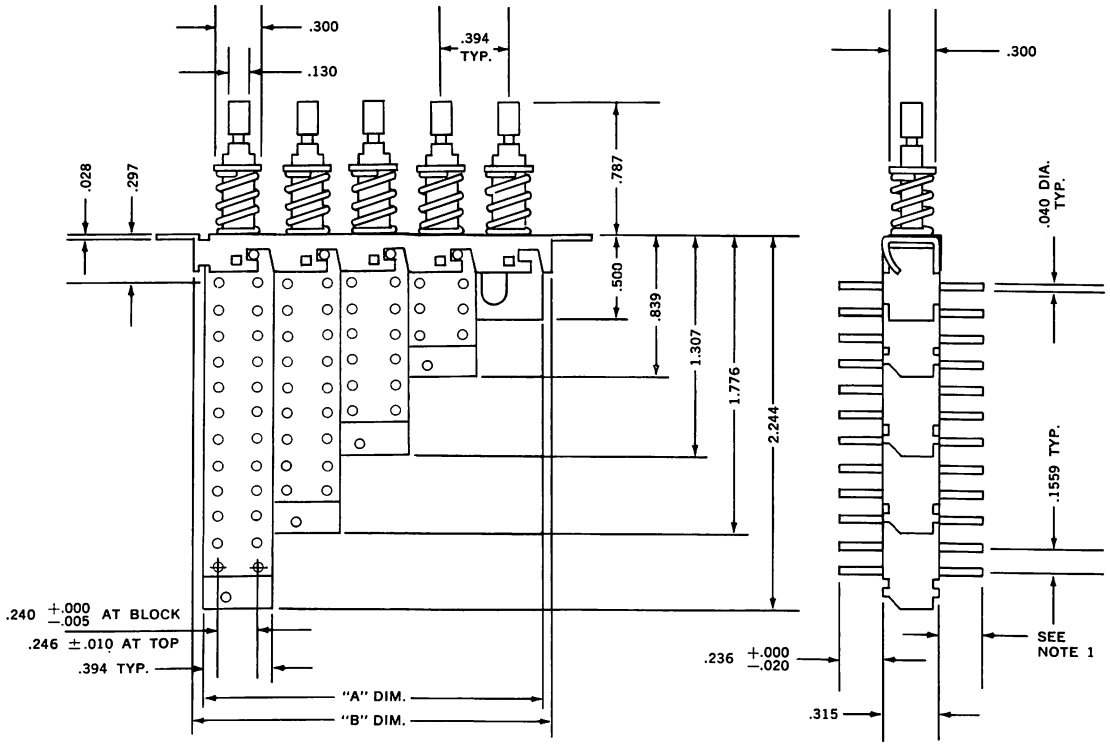


INDIVIDUAL MODULES

NOTE 1. THE LENGTH OF THE BOTTOM TERMINALS IS .394 MAXIMUM AND MAY BE REDUCED IN .078" INCREMENTS TO A .078 MINIMUM.



NOTE: STANDARD MOUNTING HOLES ARE .110 DIA. A SEMI-EXTRUDED .090 DIA. HOLE (TO BE USED WITH A #4 SHEETMETAL SCREW) IS AVAILABLE.



PB 10 SERIES

MODULE ASSEMBLY DIMENSIONS (INCHES)

	NUMBER OF SWITCH MODULES																	
	2	3	4	5	*6	7	*8	9	*10	11	*12	13	*14	15	*16	17	*18	19
"A" DIMENSION	.787	1.181	1.575	1.962	2.363	2.756	3.150	3.543	3.937	4.331	4.725	5.118	5.513	5.906	6.300	6.693	7.097	7.480
"B" DIMENSION	.925	1.378	1.713	2.165	2.953	2.953	3.740	3.740	4.528	4.528	5.315	5.315	6.102	6.102	6.890	6.890	7.677	7.677
MOUNTING CENTER	1.102	1.732	1.890	2.520	3.307	3.307	4.095	4.095	4.882	4.882	5.669	5.669	6.457	6.457	7.244	7.244	8.032	8.032
BRACKET OVERALL	1.299	1.969	2.087	2.756	3.543	3.543	4.331	4.331	5.118	5.118	5.906	5.906	6.693	6.693	7.480	7.480	8.268	8.268

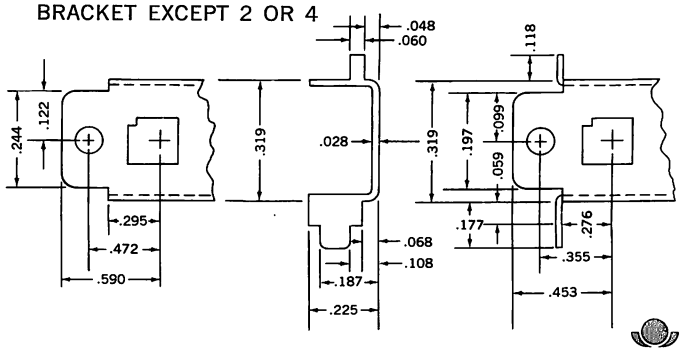
* THE EVEN NUMBERED MODULE ASSEMBLIES, STARTING WITH *6 THROUGH *18 WILL BE SUPPLIED WITH A MOUNTING BRACKET WITH THE DIMENSIONS THAT ARE REQUIRED FOR THE NEXT ODD NUMBERED MODULE ASSEMBLY.

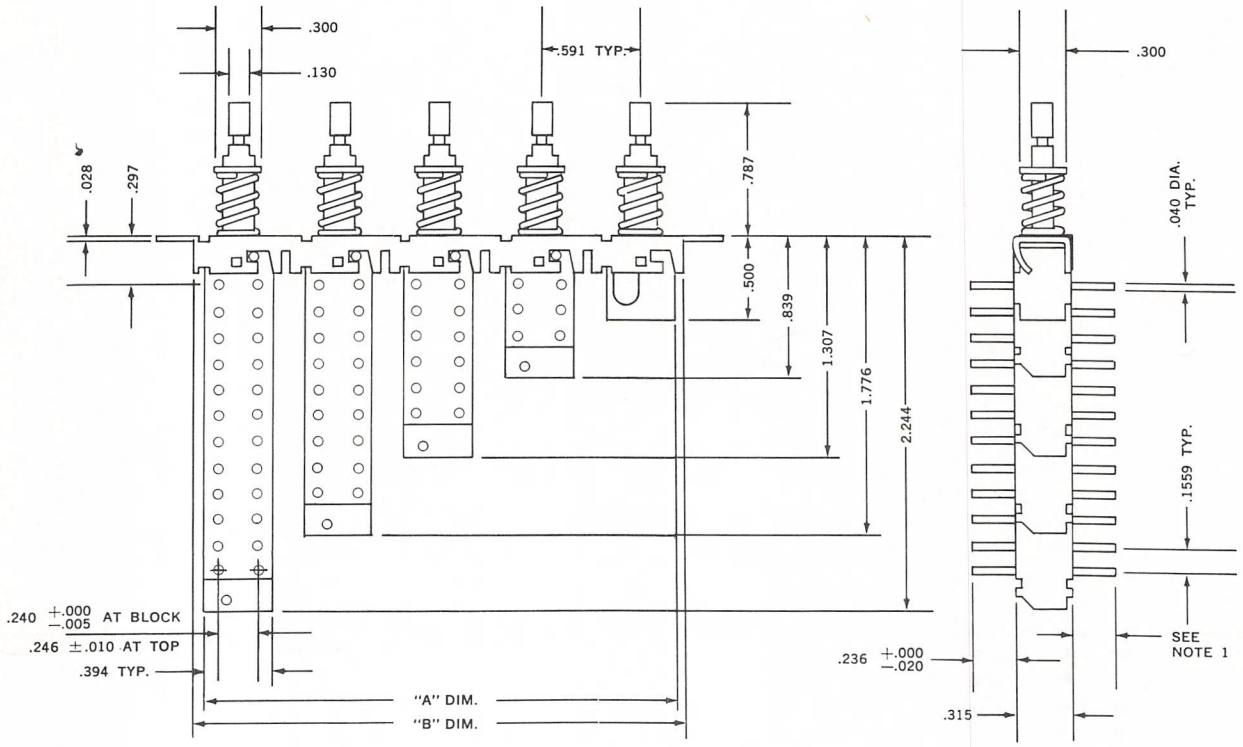
NOTE 1. THE STANDARD LENGTH OF THE BOTTOM TERMINALS IS .236". THE MAXIMUM LENGTH IS .394 AND MAY BE REDUCED IN .078 INCREMENTS TO A .078 MINIMUM.

STANDARD MOUNTING HOLES FOR THIS SERIES WHEN OTHER THAN 2 OR 4 MODULES ARE MOUNTED ARE EITHER .110 DIA. OR A SEMI-EXTRUDED .090 HOLE FOR USE WITH A #4 SHEET METAL SCREW. WHEN 2 OR 4 MODULES ARE MOUNTED THE STANDARD MOUNTING HOLE IS .090" DIA. (A .110" DIA. HOLE IS AVAILABLE AT EXTRA COST—IT REQUIRES A SECONDARY OPERATION ON THE LATCH BAR.)

ANY NO. OF MODULES MOUNTED ON THE BRACKET EXCEPT 2 OR 4

2 OR 4 MODULES MOUNTED ON THE BRACKET





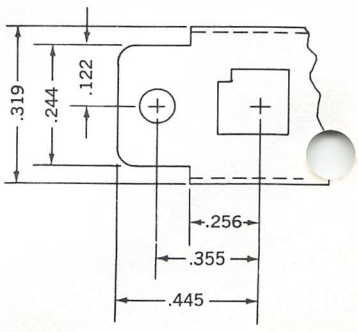
PB 15 SERIES

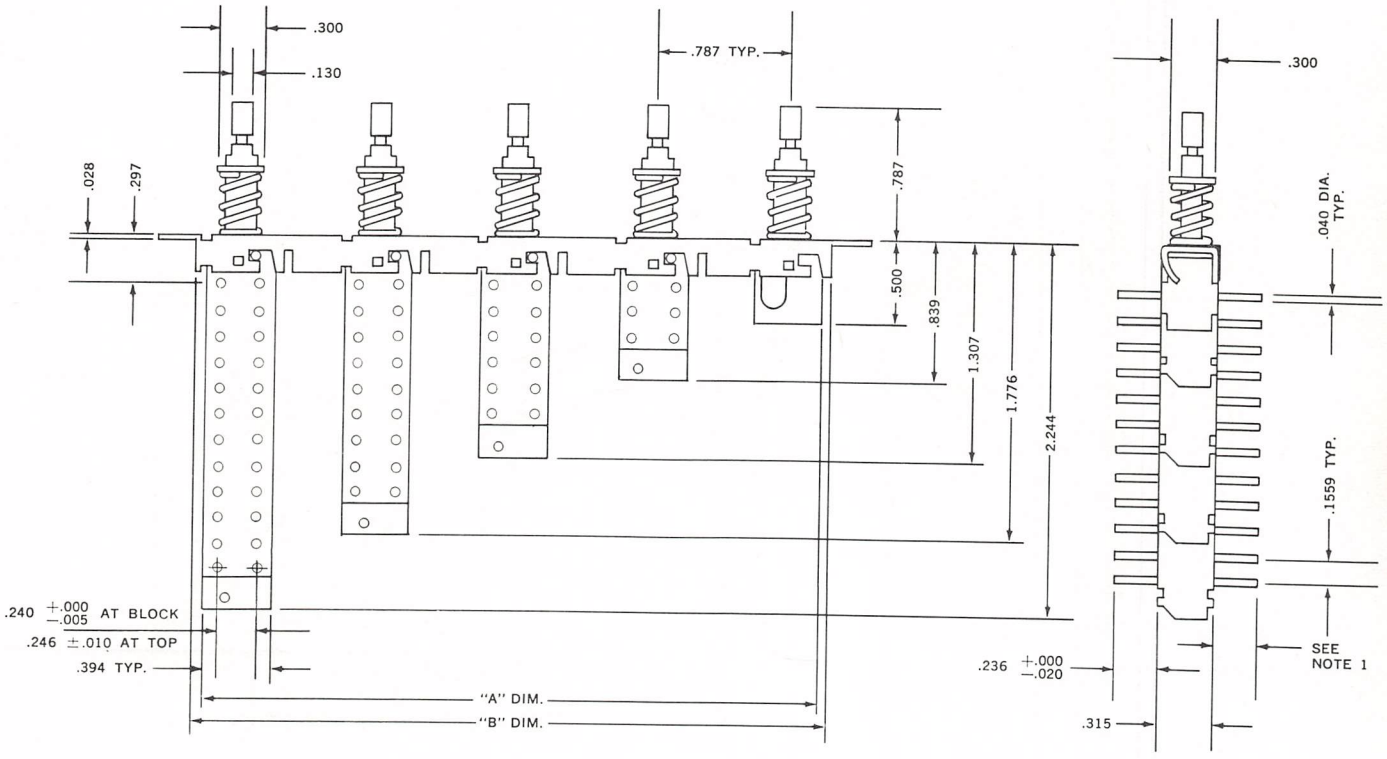
MODULE ASSEMBLY DIMENSIONS (INCHES)

	NUMBER OF SWITCH MODULES								
	2	3	4	5	6	7	8	9	10
"A" DIMENSION	.984	1.575	2.165	2.756	3.346	3.937	4.528	5.118	5.709
"B" DIMENSION	1.102	1.693	2.284	2.874	3.465	4.055	4.646	5.236	5.827
MOUNTING CENTER	1.299	1.890	2.480	3.071	3.661	4.252	4.843	5.433	6.024
BRACKET OVERALL	1.480	2.071	2.661	3.252	3.843	4.433	5.024	5.614	6.205

NOTE 1. THE STANDARD LENGTH OF THE BOTTOM TERMINALS IS .236". THE MAXIMUM LENGTH IS .394 AND MAY BE REDUCED IN .078 INCREMENTS TO A .078 MINIMUM.

NOTE: THE STANDARD MOUNTING HOLE DIA. FOR THIS SERIES IS .090". (A .110" DIA. HOLE IS AVAILABLE AT EXTRA COST — IT REQUIRES A SECONDARY OPERATION ON THE LATCH BAR.)





PB 20 SERIES

MODULE ASSEMBLY DIMENSIONS (INCHES)

	NUMBER OF SWITCH MODULES								
	2	3	4	5	6	7	8	9	10
"A" DIMENSION	1.181	1.969	2.756	3.543	4.331	5.118	5.906	6.693	7.480
"B" DIMENSION	1.378	2.165	2.953	3.740	4.528	5.315	6.102	6.890	7.677
MOUNTING CENTER	1.732	2.520	3.307	4.095	4.882	5.669	6.457	7.244	8.032
BRACKET OVERALL	1.969	2.756	3.543	4.331	5.118	5.906	6.693	7.480	8.268

NOTE 1. THE STANDARD LENGTH OF THE BOTTOM TERMINALS IS .236". THE MAXIMUM LENGTH IS .394 AND MAY BE REDUCED IN .078 INCREMENTS TO A .078 MINIMUM.

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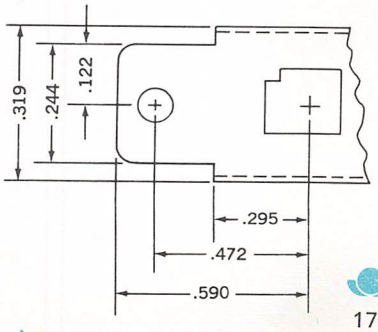

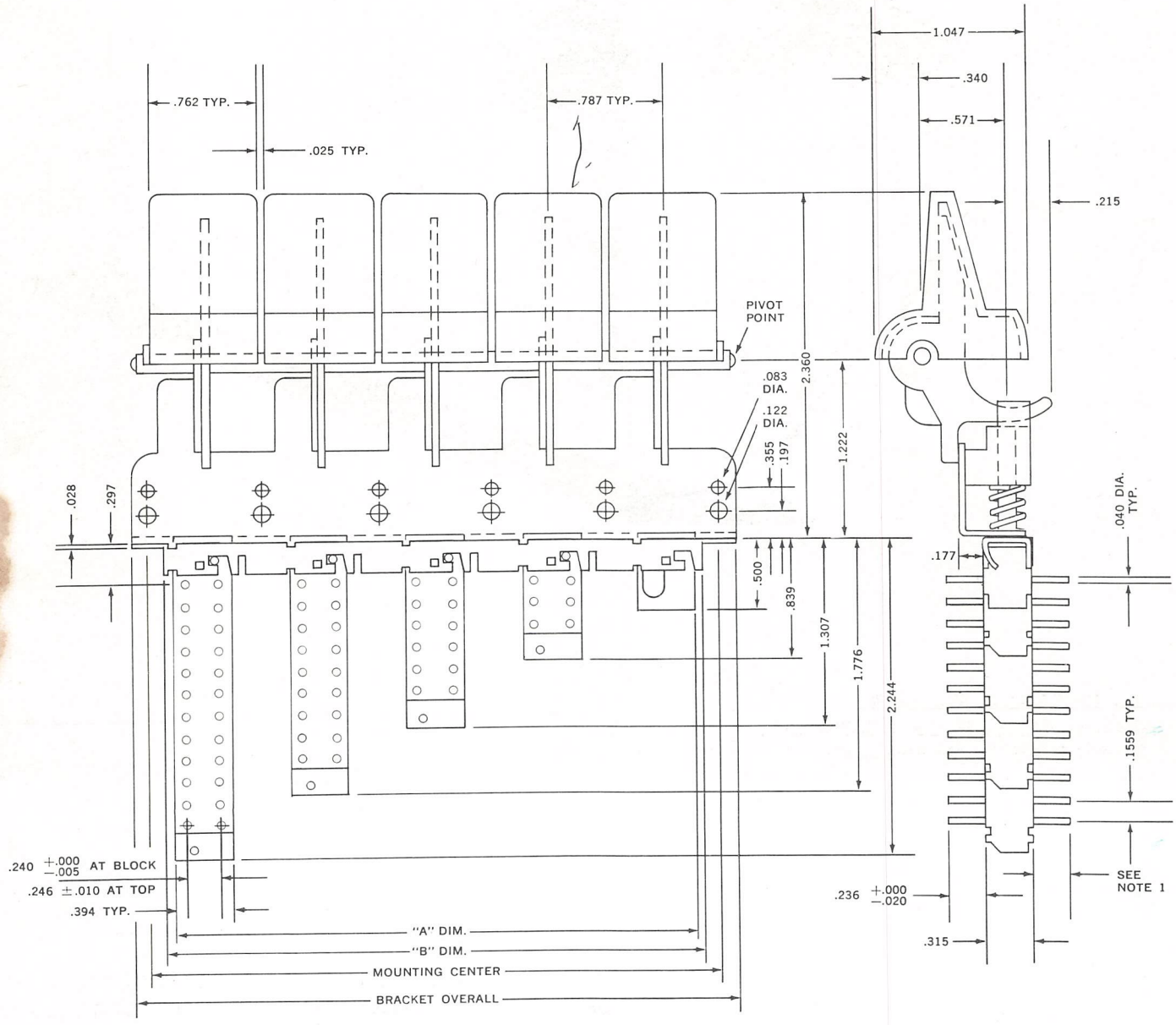

PB 20PK SERIES

MODULE ASSEMBLY DIMENSIONS (INCHES)

	NUMBER OF SWITCH MODULES								
	2	3	4	5	6	7	8	9	10
"A" DIMENSION	1.181	1.969	2.756	3.543	4.331	5.118	5.906	6.693	7.480
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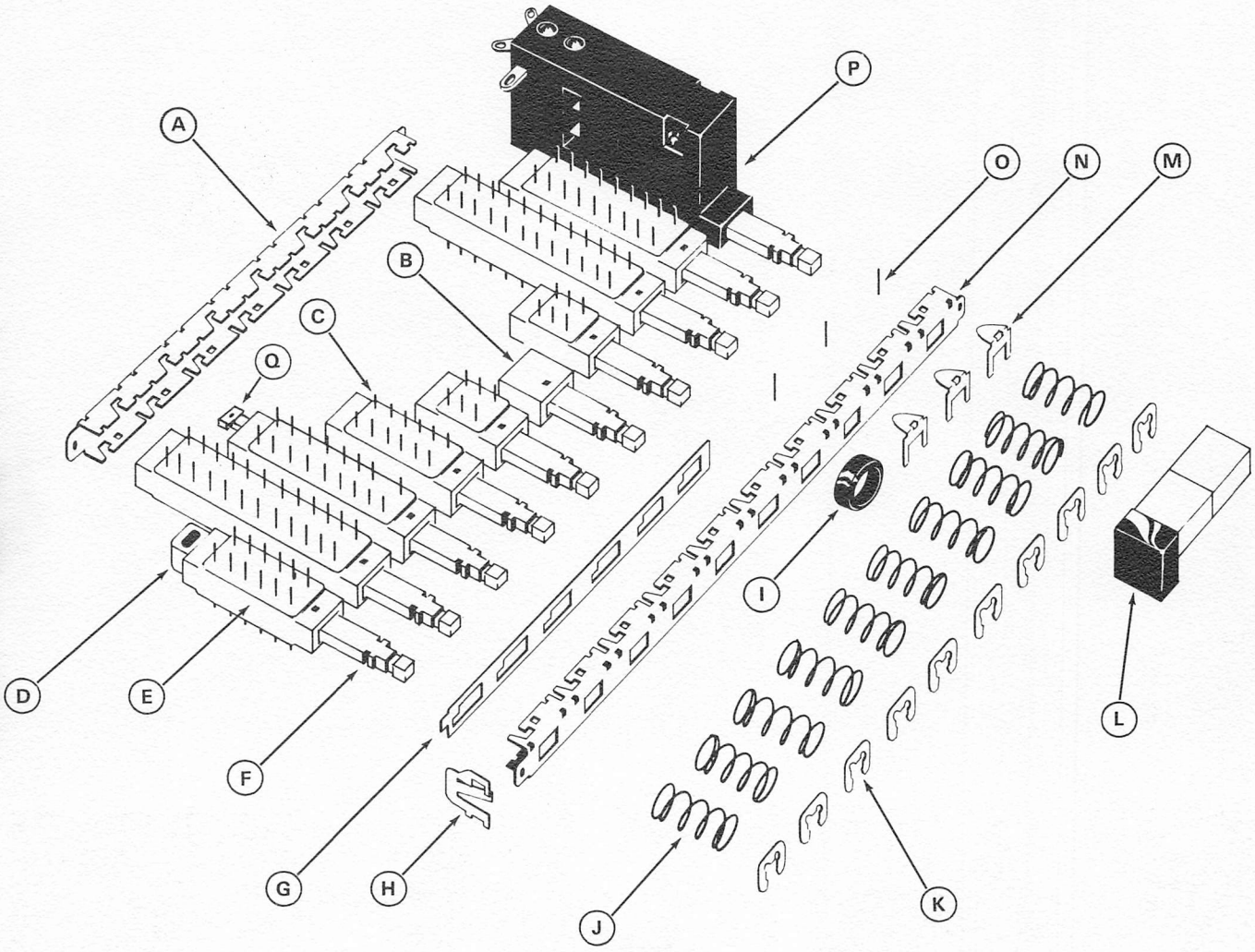
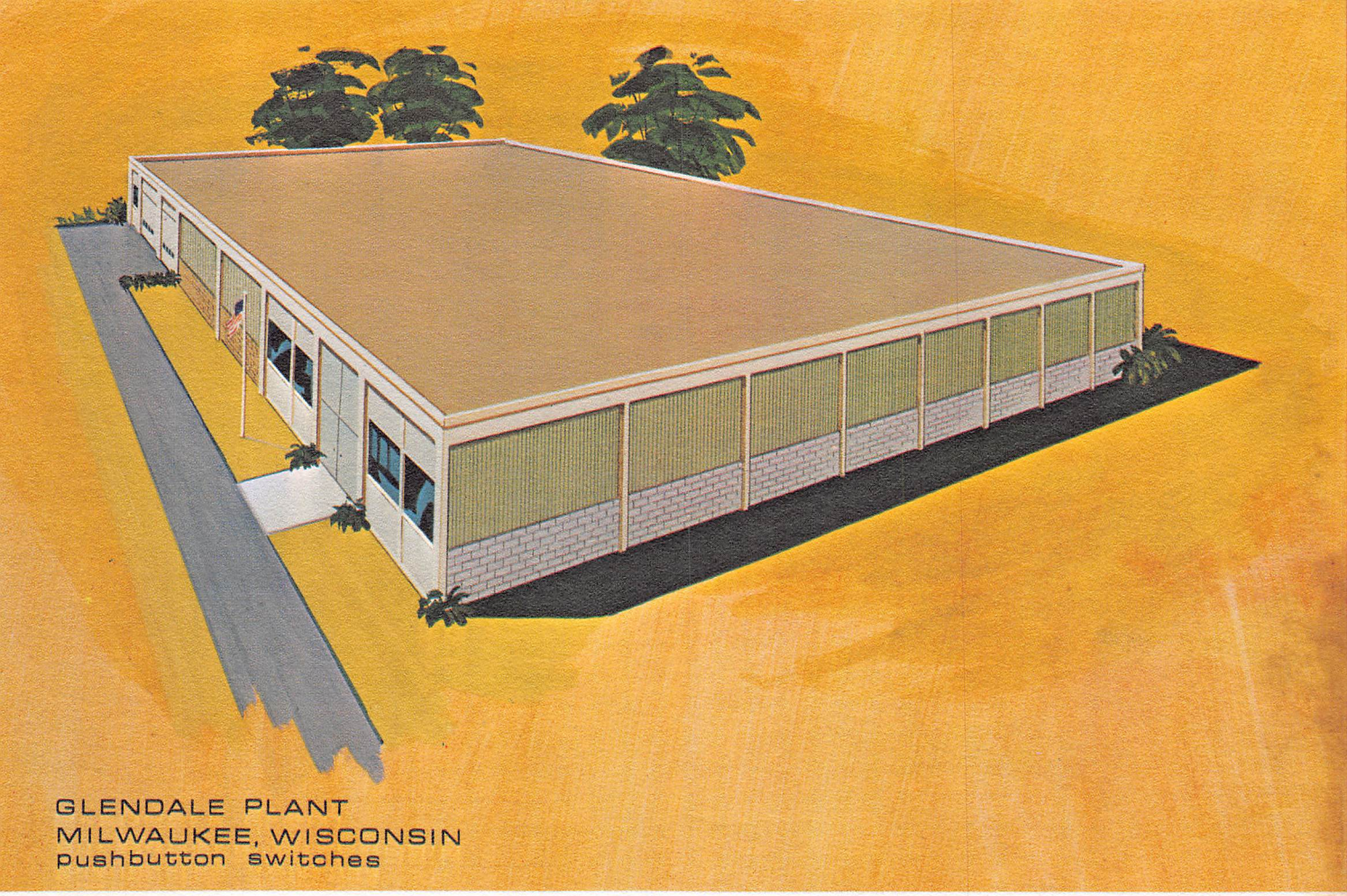


NOMENCLATURE

A. Rear Mounting Bracket
B. Clearing Module
C. Fixed Contact Terminal
D. Rear Coupling
E. Stator Block
F. Slider Bar
G. Latch Bar
H. Latch Bar Spring
I. Momentary Action Stop Ring
J. Return Spring
K. Retaining Clip
L. Buttons
M. Push-Push Pin Spring
N. Front Mounting Bracket
O. Push-Push Pin
P. Line Switch
Q. Slide Bar Coupler



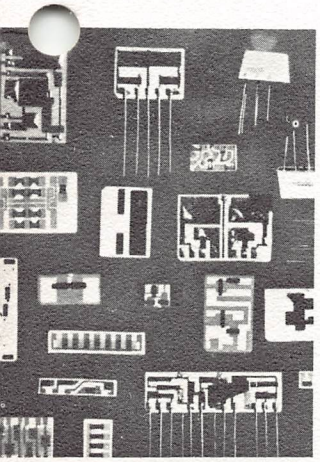
GLENDALE PLANT
MILWAUKEE, WISCONSIN
pushbutton switches

Centralab's line of push button switches is now being produced in a completely new manufacturing facility.

The installation occupies over 28,000 square feet and is located in close proximity to the Engineering Building in the new Globe-Union Administrative and Research Park. Under construction since early 1966, it was formally opened in November of that year and is currently operating at full capacity.

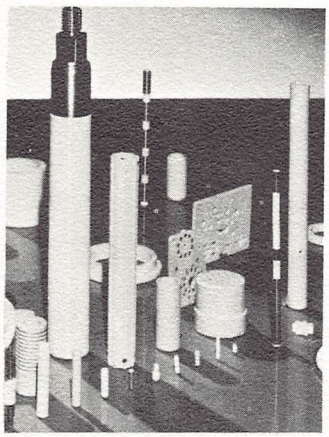
Here, equipment and machinery of the most modern design are combined with skilled workmanship and advanced techniques to assure efficient production and prompt delivery of a quality line of switches.

OTHER CENTRALAB QUALITY PRODUCTS

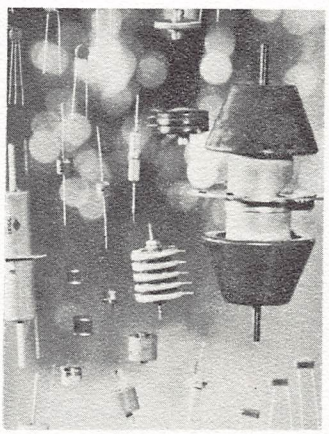


ntegrated Circuits Custom nybrid semiconductor circuits can be fabricated to your exact specifications, and standard circuit packages are available through Centralab distributors.

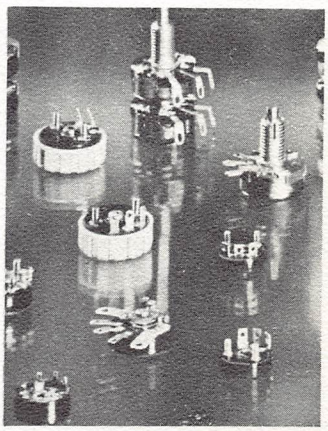
Centralab PECs cover a wide spectrum of environmental parameters for applications in industrial and military as well as consumer products.



Technical Ceramics From .7u inch surface finish substrate, unequalled for microelectronics, to large regular or irregular shapes with or without complex hole patterns and/or metalization.



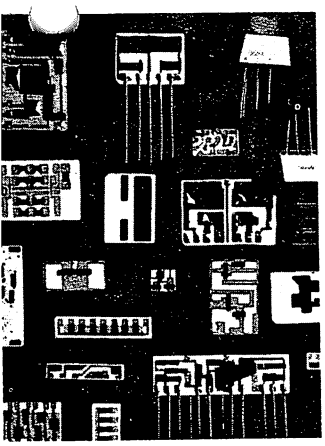
Capacitors The industry's largest assortment of ceramic capacitors: feed through, trimmer, disc, semi-conductor ultra-high capacity, high voltage, flat plate, discoidal, precision, and all sorts of temperature compensating. Many of these types are available from distributors.



Potentiometers In sizes from those suitable for hearing aids to 5 watt wirewound in the usual 2 watt case size. For applications from the entertainment industry to MIL spec. Composition, hot molded, wire-wound or deposition on ceramic. Extensive distributor stocks.

Request your free copy of Centralab's Rotary, Slide and Lever Switch Catalog, form S-1a.

OTHER CENTRALAB QUALITY PRODUCTS



Integrated Circuits Custom hybrid semiconductor circuits can be fabricated to your exact specifications, and standard circuit packages are available through Centralab distributors.

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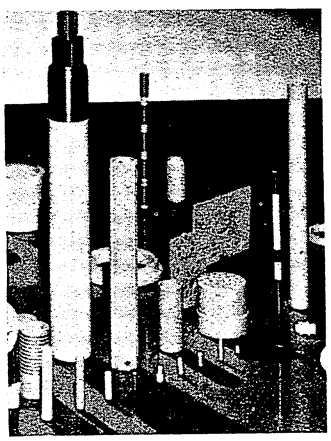

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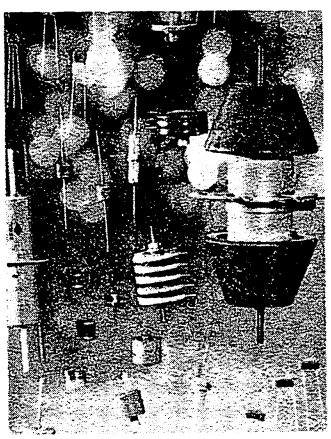

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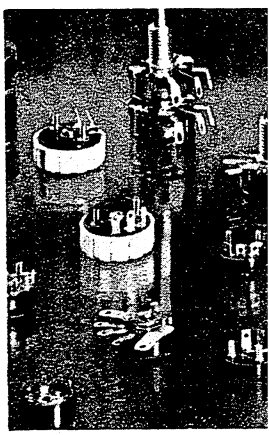

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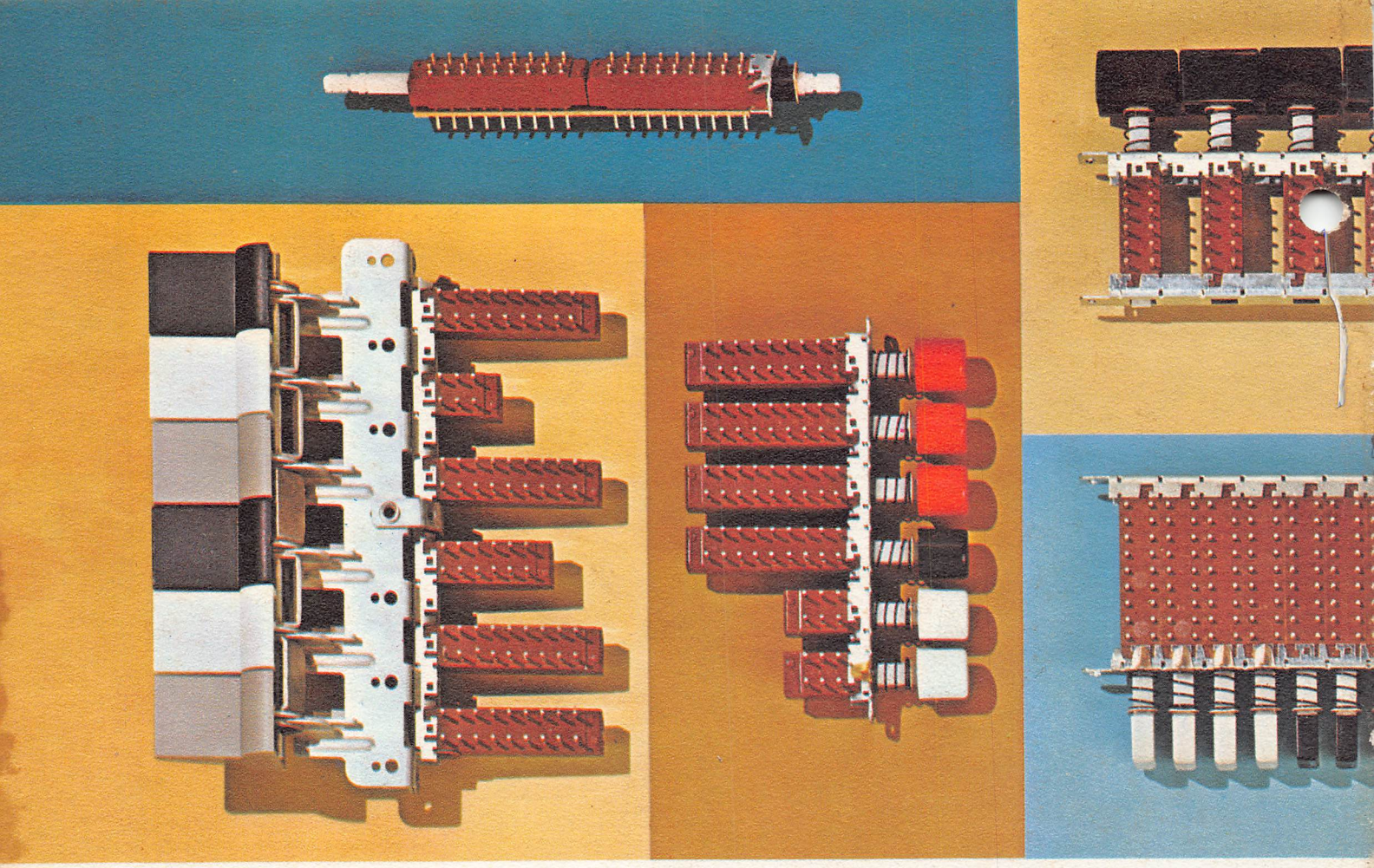

manufacturer of

CAPACITORS
INTEGRATED CIRCUITS
POTENTIOMETERS
SWITCHES
TECHNICAL CERAMICS

CENTRALAB

Electronics Division
GLOBE-UNION INC.
5757 NORTH GREEN BAY AVENUE
MILWAUKEE, WISCONSIN 53201

CENTRALAB Electronics Division • GLOBE-UNION INC.
5757 NORTH GREEN BAY AVENUE • MILWAUKEE, WISCONSIN 53201

PUSH BUTTON SWITCH SPECIFICATION SHEET

CUSTOMER	CUSTOMER PART NO.	REV. NO.	DRAWN BY	DATE	CENTRALAB PART NO.

SERIES	MOUNTING BRACKET	TERMINAL LENGTH	POLE CODE	LATCH CODE	LINE SWITCH CODE
PB1	2-.110 Dia. Holes	.236 Top .236 Bottom (STD)	0 = Clearing Mod.		
PB10	2-#4 Metal Screw Holes	.236 Top .079 Bottom (SPCL)	2 = 2 Pole	IL = Interlock	LS1 = 2PSTNO
PB15		.236 Top .157 Bottom (SPCL)	4 = 4 Pole		
PB20	No Mounting Tabs	.236 Top .315 Bottom (SPCL)	6 = 6 Pole	PP = Push-Push	LS2 = 2PDT
PB20 Piano Key	Piano Key 2-.126 Dia. Holes	.236 Top .394 Bottom (SPCL)	8 = 8 Pole	M = Momentary	LS3 = 2PSTNC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
REAR BRACKET																			
LATCH SPRING POS.																			
LATCH CODE																			
LINE SWITCH																			
NO. OF POLES																			
BUTTON NO.																			
BUTTON COLOR																			

SUPPLY BUTTONS — CEMENTED TO SLIDE BAR

SUPPLY BUTTONS — BULK WITH SHIPMENT

SPECIAL REQUIREMENTS AND NOTES

CHANGES

CENTRALAB Electronics Division • GLOBE-UNION INC.
5757 NORTH GREEN BAY AVENUE • MILWAUKEE, WISCONSIN 53201

PUSH BUTTON SWITCH SPECIFICATION SHEET

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PB20 Piano Key		Piano Key 2-.126 Dia. Holes		.236 Top .394 Bottom (SPCL)		8 = 8 Pole	M = Momentary	LS3 = 2PSTNC

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
REAR BRACKET																			
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LATCH CODE																			
LINE SWITCH																			
NO. OF POLES																			
BUTTON NO.																			
BUTTON COLOR																			

SUPPLY BUTTONS — CEMENTED TO SLIDE BAR ☐ SUPPLY BUTTONS — BULK WITH SHIPMENT ☐

SPECIAL REQUIREMENTS AND NOTES

CHANGES